

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application. An identifier indicating the status of each claim is provided.

Listing of Claims

1. (Currently Amended) A recording apparatus for recording video data to a record medium, comprising:

video encoding means for encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

video data output means for outputting encoded video data by said encoding means;

audio data output means for outputting compression-encoded or non-compressed audio data;

management data generating means for generating management data which manages said encoded video data and said audio data of said file structure;

transforming means for transforming the data structure of encoded video data that is output from said video data output means, audio data that is output from said audio output means, and the management data into a file structure; and

recording means for recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output means, a first audio data unit which corresponds to a predetermined number of sound samples of

said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. ~~at least the start position of the second video data unit and the second audio data unit respectively.~~

2. (Currently Amended) A recording apparatus for recording video data to a rewritable optical disc, comprising:

video encoding means for encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

video data output means for outputting encoded video data by said encoding means;

audio data output means for outputting compression-encoded or non-compressed audio data;

management data generating means for generating management data which manages said encoded video data and said audio data of said file structure;

transforming means for transforming the data structure of encoded video data that is output from said video data output means, audio data that is output from said audio output means, and the management data into a file structure; and

recording means for recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output means, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. at least the start position of the second video data unit and the second audio data unit respectively.

3. (Original) The recording apparatus as set forth in claim 1,
wherein the compression-encoding process is MPEG,
wherein the group structure is GOP structure, and

wherein data of which a sequence header is added to each GOP is matched with the first data unit.

4. (Canceled)

5. (Canceled)

6. (Currently Amended) A recording apparatus for recording video data and audio data to a rewritable optical disc, comprising:

video encoding means for encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

video data output means for outputting encoded video data by said encoding means;

audio data output means for outputting compression-encoded or non-compressed audio data;

management data generating means for generating management data which manages said encoded video data and said audio data of said file structure;

transforming means for transforming the data structure of encoded video data that is output from said video data output means, audio data that is output from said audio output means, and the management data into a file structure; and

recording means for recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output means, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively ~~includes at least the start position of the second video data unit and the second audio data unit respectively.~~

7. (Previously Presented) The recording apparatus as set forth in claim 6, wherein the duration of the encoded video data of the second data unit is the same as the duration of the encoded audio data of the second data unit in the multiplexed data.

8. (Previously Presented) The recording apparatus as set forth in claim 6, wherein the encoded video data of the second data unit and the encoded audio data of the second data unit are alternately placed in the multiplexed data, each of the encoded video data of the second data unit and the encoded audio data of the second data unit being matched with the successive record length.

9. (Canceled)

10. (Canceled)

11. (Previously Presented) The recoding apparatus as set forth in claim 1,
wherein the file structure further includes a data portion containing management
information, and

wherein the data portion contains size information of the first video data unit and
position information of the second video data unit.

12. (Currently Amended) A recording method for recording video data to a
record medium, comprising the steps of:

encoding video data and audio data in a group structure of a plurality of frames by
performing a compression-encoding process;

outputting encoded video data by said encoding step;

outputting compression-encoded or non-compressed audio data;

generating management data which manages said encoded video data and said
audio data of said file structure;

transforming the data structure of encoded video data that is output from said
video data output step, audio data that is output from said audio output step, and the management
data into a file structure; and

recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. ~~at least the start position of the second video data unit and the second audio data unit respectively.~~

13. (Currently Amended) A recording method for recording video data to a rewritable optical disc, comprising the steps of:

encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

outputting encoded video data by said encoding step;

outputting compression encoded or non-compressed audio data;

generating management data which manages said encoded video data and said audio data of said file structure;

transforming the data structure of encoded video data that is output from said video data output step, audio data that is output from said audio output step, and the management data into a file structure; and

recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. at least the start position of the second video data unit and the second audio data unit respectively.

14. (Currently Amended) A recording method for recording audio data to a rewritable optical disc, comprising the steps of:

- encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;
- outputting encoded video data by said encoding step;
- outputting compression-encoded or non-compressed audio data;
- generating management data which manages said encoded video data and said audio data of said file structure;
- transforming the data structure of encoded video data that is output from said video data output step, audio data that is output from said audio output step, and the management data into a file structure; and
- recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. ~~at least the start position of the second video data unit and the second audio data unit respectively.~~

15. (Currently Amended) A recording method for recording video data and audio data to a record medium, comprising the steps of:

- encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;
- outputting encoded video data by said encoding step;
- outputting compression-encoded or non-compressed audio data;
- generating management data which manages said encoded video data and said audio data of said file structure;
- transforming the data structure of encoded video data that is output from said video data output step, audio data that is output from said audio output step, and the management data into a file structure; and
- recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. ~~at least the start position of the second video data unit and the second audio data unit respectively.~~

16. (Currently Amended) A recording method for recording video data and audio data to a rewritable optical disc, comprising the steps of:

encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

outputting encoded video data by said encoding step;

outputting compression encoded or non-compressed audio data;

generating management data which manages said encoded video data and said audio data of said file structure;

transforming the data structure of encoded video data that is output from said video data output step, audio data that is output from said audio output step, and the management data into a file structure; and

recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. ~~at least the start position of the second video data unit and the second audio data unit respectively.~~

17. (Currently Amended) A record medium on which a program for recording video data to a record medium has been recorded, the program causing a computer to perform the steps of:

encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

outputting encoded video data by said encoding step;

outputting compression encoded or non-compressed audio data;

generating management data which manages said encoded video data and said audio data of said file structure;

transforming the data structure of encoded video data that is output from said video data output step, audio data that is output from said audio output step, and the management data into a file structure; and

recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. ~~at least the start position of the second video data unit and the second audio data unit respectively.~~

18. (Currently Amended) A record medium on which a program for recording video data to a rewritable optical disc has been recorded, the program causing a computer to perform the steps of:

encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

outputting encoded video data by said encoding step;

outputting compression encoded or non-compressed audio data;

generating management data which manages said encoded video data and said audio data of said file structure;

transforming the data structure of encoded video data that is output from said video data output step, audio data that is output from said audio output step, and the management data into a file structure; and

recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. ~~at least the start position of the second video data unit and the second audio data unit respectively.~~

19. (Currently Amended) A record medium on which a program for recording audio data to a rewritable optical disc has been recorded, the program causing a computer to perform the steps of:

encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

outputting encoded video data by said encoding step;

outputting compression encoded or non-compressed audio data;

generating management data which manages said encoded video data and said audio data of said file structure;

transforming the data structure of encoded video data that is output from said video data output step, audio data that is output from said audio output step, and the management data into a file structure; and

recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of

said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. at least the start position of the second video data unit and the second audio data unit respectively.

20. (Currently Amended) A record medium on which a program for recording video data and audio data to a record medium has been recorded, the program causing a computer to perform the steps of:

encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

outputting encoded video data by said encoding step;

outputting compression encoded or non-compressed audio data;

generating management data which manages said encoded video data and said audio data of said file structure;

transforming the data structure of encoded video data that is output from said video data output step, audio data that is output from said audio output step, and the management data into a file structure; and

recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. at least the start position of the second video data unit and the second audio data unit respectively.

21. (Currently Amended) A record medium on which a program for recording video data and audio data to a rewritable optical disc has been recorded, the program causing a computer to perform the steps of:

encoding video data and audio data in a group structure of a plurality of frames by performing a compression-encoding process;

outputting encoded video data by said encoding step;

outputting compression encoded or non-compressed audio data;

generating management data which manages said encoded video data and said audio data of said file structure;

transforming the data structure of encoded video data that is output from said video data output step, audio data that is output from said audio output step, and the management data into a file structure; and

recording said transformed encoded video data, the audio data, and the management data to a record medium,

wherein the file structure contains a first video data unit which corresponds to a predetermined number of frames of said encoded video data outputted from said video output step, a first audio data unit which corresponds to a predetermined number of sound samples of said audio data, a second video data unit which comprises a plurality of said first video data units, and a second audio data unit which comprises a plurality of said first audio data units,

wherein said second video data unit and said second audio data unit are recorded on a successive location of said record medium respectively; and

wherein said management data includes video track and audio track independently, and

wherein the video track contains a size quantity of the first video data and a start position of the second video data and the audio track contains a size quantity of said first audio data and a start position of said second audio data respectively. ~~at least the start position of the second video data unit and the second audio data unit respectively.~~

22. (Previously Presented) The recording apparatus as set forth in claim 1,
wherein said first video data unit and said first audio data unit correspond to the
encoding unit which can be decoded respectively.

23. (Previously Presented) The recording apparatus as set forth in claim 1,
wherein said transforming means transforms the data structure of said encoded
video data and said audio data into said file structure which contains said first video unit, said
first audio data unit, a second video data unit, a second video data unit, said second audio data
unit, and a resource data which includes at least the size of said first video data unit and said first
audio data unit; and

said recording means records said resource data to said record medium.

24. (Previously Presented) The recording apparatus as set forth in claim 1
wherein said recording means records said transformed encoded video data and
said audio data to said record medium so that said second video data unit and said second audio
data unit are recorded on a successive record length of said record medium respectively.

25. (Previously Presented) The recording apparatus of claim 1,
wherein said recording means records said transformed encoded video data and
said audio data to said record medium so that said second video unit and said second audio unit
are placed in such a manner that said second video data unit is adjacent to said second audio data
unit corresponding thereto.

26. (Previously Presented) The recording apparatus according to claim 1,
wherein the second video data unit and said second audio data unit are recorded
on a successive location of said record medium.

27. (Previously Presented) The recording method according to claim 12,
wherein the second video data unit and said second audio data unit are recorded
on a successive location of said record medium.

28. (New) The recording apparatus according to claim 1,
wherein the video track contains information representing a relationship between
the first video data and a time base and the audio track contains information representing a
relationship between the first audio data and a time base.